

FIRE PROTECTION PLAN

For The

Meadowood Project

Unincorporated San Diego County, CA



August 29, 2005 (Revised July 10, 2009)

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Meadowood - TM 5354
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FIRE PROTECTION PLAN
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Executive Summary

This Fire Protection Plan (FPP) evaluates the proposed Meadowood development to ensure it does not unnecessarily expose people or structures to fire risks and hazards. The FPP identifies and prioritizes the measures necessary to adequately mitigate those impacts. The FPP has considered the property location, topography, geology, combustible vegetation (fuel types), climatic conditions and fire history. It considers water supply, access, structure ignitability and fire resistive building materials, fire protection systems and equipment, impacts to existing emergency services, defensible space and vegetation management.

The project was analyzed to identify potential adverse impacts and to identify adequate measures for impacts resulting from wildland fire hazards. The evaluation determined that the North County Fire Protection District, and the California Department of Forestry and Fire Protection (CAL FIRE) along with nearby fire departments will be able to provide adequate emergency services. CAL FIRE (under the State Responsibility Area Agreement) as well as other fire departments and fire protection districts, can be requested under a Mutual Aid agreement to respond in the event of wildfire event in the area. Fire apparatus times and the proximity of the development to the Wildland Urban Interface (WUI), in a Very High Fire Hazard Severity Zone require that fire sprinklers be installed in all new residences.

In addition this FPP lists fuel modification requirements to mitigate the exposure of people or structures from a significant risk of loss, injury or death from wildland fires. Zone 1 will be an irrigated landscaped zone and is commonly called the defensible space zone for fire suppression forces and protects structures from radiant and convective heat. This landscaped zone is permanently irrigated and consists of fire resistant and maintained plantings. Zone 2 is the area beyond Zone 1, including manufactured slopes and excludes all prohibited highly combustible native vegetation, but permits plantings with very specific criteria and reduces the existing native vegetation by 50%. A Home Owners Association will be responsible to the North County Fire Protection District Fire Marshal for the annual completion of all designated Fuel Modification Treatments in common areas prior to June 15th or when fuels become cured.

Finally, this FPP and its requirements will be incorporated by reference into the final project Conditions of Approval to ensure compliance with County codes/regulations and significance standards.

MEADOWOOD PROJECT – TM 5354

FIRE PROTECTION PLAN

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FIRE PROTECTION PLAN

For The

Meadowood Project – TM 5354

San Diego County, California

August 29, 2005 (Revised July 10, 2009)

1.0 General Description

The Meadowood Project is located within a declared Very High Fire Hazard Severity Zone in the eastern most portions of the project and a High Fire Hazard Zone for all other areas. These classifications are due to the type of vegetation, fire history and rough topography in the area. The Meadowood site is adjacent to the service boundaries of the North County Fire Protection District (NCFPD), and within the District's sphere of influence. At this time no portion of the project area is located in the District. Efforts are underway by the Project Applicant to annex the project into the NCFPD. At the time of this FPP, current annexation fees are \$1,000 for each acre or portion thereof and \$500 for each dwelling parcel. The Applicant is also in discussions with the NCFPD regarding potential provision or upgrade of fire suppression facilities and/or equipment to address additional infrastructure and/or response demands that may be placed upon the District as a result of the Proposed Project. The irregular shaped project boundary takes up 389.5 acres and is located within an unincorporated portion of northern San Diego County, California (See Photo No. 1).

The Meadowood Project site is located east of Interstate 15 and north of Pala Road (SR76) in valley and foothill topography which is currently used primarily for citrus and avocado orchards. Within the large parcel are both native and exotic plants. All of the proposed single-family and multi-family homes (844 dwelling units) will be located west of Monserate Mountain and east of an intermittent stream that feeds the San Luis Rey River located to the south. Nearly half of the site will remain in open space or retained as Home Owners Association (H.O.A.) managed orchard. The vegetation located adjacent to the existing orchard is nearly all covered in sensitive biological habitat known as Coastal Sage Scrub. Additionally, riparian vegetation associated with the intermittent stream west of the project boundary is also designated protected habitat.

As shown in Photo No. 1, the hillside environment outside of the orchards is dominated by Coastal Sage Scrub vegetation that is frequently referred to herein as Sage/Buckwheat vegetation. In canyons where moisture is more available, isolated pockets of heavier vegetation is found. It is likely to continue to support these plant communities without human intervention.



↑ Photo 1: View of the project building site taken From Near The Eastern Border. The homes are to be located to the left out of view. The vegetative fuels including the orchard around the perimeter of the project are to remain.

The Project is being developed by Pardee Homes of San Diego, California. Project Engineer is Rick Engineering of San Diego. The homes are to be built west of the north/south oriented Monserate Mountain and clustered to reduce overall environmental impacts. Following construction, the Meadowood Project will be surrounded by native and exotic vegetation. Additional development by other builders is being planned to the west and north.

The Meadowood Project includes the following discretionary applications; a General Plan Amendment, a Specific Plan Amendment, a Rezone, a Vesting Tentative Map, 3 Site Plans and a Major Use Permit for the wastewater treatment facility. The site is 389.5 acres and located just north of the State Route 76, otherwise known as Pala Road, approximately ¼ miles east of Interstate 15 in the Fallbrook Community Planning Area. The main access will be taken via Horse Ranch Creek Road which will extend north from SR76 and connect to Pankey Road, which then connects north off-site to Stewart Canyon Road. A paved secondary fire access road, extending northeasterly from Street E to Rice Canyon Road, will provide alternative access for emergency vehicles. The community will consist of a mix of single-family and multi-family home products totaling 844 units with the school (See Table 1).

TABLE 1: LAND USE SUMMARY					
Planning Area	Use	Proposed Zoning	Gross Acreage	Proposed Dwelling Units	*Actual Density
1	Multi-Family Detached/ Wastewater Treatment Facility	RV10	26.1	164	6.3
2	Elementary School	RV10	12.7	**42	3.3
3	Neighborhood Park	S80	10.1	---	----
4	Multi-Family Attached	RU20	24.0	325	13.5
5	Single-Family Detached	RS3	132.5	355	2.7
6	Agricultural Open Space	S80	47.6	---	----
7	Natural Open Space (including 5.6 acre water tank site)	S80	128.5	---	----
	Roads, etc.	---	8.0	---	----
	Totals		389.5	886	2.3

* Density = dwelling units per acre

** The 42 units are intended to designate a land use for the parcel if the school district decided not to utilize the land.

Note: The numbers in the table may be revised during the final mapping process. Deviations from the above must be approved by the NCFPD.

The area has an active wildland fire history according to the California Department of Forestry and Fire Protection (CAL FIRE) Fire Plan personnel. There have been over 10 large wildland fires of over 100 acres during the fifty years in the general area. The majority of these occurred to the north and west. The most recent wildfire to threaten the project was the October 22, 2007 Rice Canyon Fire which burned 9,472 acres immediately north of the Project. These fires have tended to burn rapidly during hot, dry, and windy weather. Wildfire threats are diminishing as both development and agricultural land use fragments the natural landscape. The Project will be separated from large areas of wildland fuels such as the Cleveland National Forest located over five miles to the east due to both existing and planned development adjacent to the Project. Regardless of past history, the

combination of fuels, topography, and weather factors combine to create the potential for a significant wildland fire impacting the Project.

For the purpose of this FPP, both native fuel treatment and recommendations regarding landscape plants suitable for a high fire hazard area that are consistent with the NCFPD requirements are addressed in this document. While the land scheduled for development will have its own FPP, it is very important to understand that fuel treatment between the current and future structures must be interlinked with both on-site and off-site development to protect all the structures in the community from wildland fire.

Due to on-site open space and moderately steep topography that exists within the property, the structures that are built must be able to "stand alone". The major planned access road to the Meadowood Project building site consists of Horse Ranch Creek Road connecting with Pala Road or Highway 76 to the south. Two additional secondary access roads are to be located to the north and west. Street "R" would be extended to connect to Pala Mesa Drive off-site. A connection with Pala Mesa Drive at the Interstate 15 bridge is required. Additionally, secondary access to Rice Canyon via a northeasterly extension of Street "E" and northward extension of Street "D" to Pala Mesa Heights Drive is required. Prior to any building construction, appropriate fuel modification will need to be in place.

This FPP assesses the overall (on-site and off-site) wildland fire hazards and risks that may threaten life and property associated with the proposed Project. In addition, the FPP addresses both short-term and long-term fuel modification treatment actions required to minimize any projected fire hazards and risks and assigns long-term annual maintenance responsibilities for each of the required fuel modification actions.

The purpose of this FPP is to provide fuel modification zone treatment direction for developers, architects, builders, NCFPD and San Diego County Planning Officials to use in making the proposed structures reasonably safe from future wildland fires.



↑ **Photo 2: Lightning may ignite a wildfire. Once every few years, a storm may enter the project area from the south or east.**

The FPP includes:

- A wildland fire hazard rating assessment and calculations of the expected fire behavior in the event a wildland fire should occur within the off-site and on-site native and exotic vegetation.
- Preparation of computer-generated expected wildland fire behavior projections for the undeveloped natural areas within and/or adjacent to the planned development and make fuel modification recommendations to mitigate any existing wildland fire hazard condition.

- Development of site-specific fuel modification proposals to protect the planned structures from any losses due to a wildland fire.
- Presentation of "*firewise landscaping*" zone criteria for the two fuel treatment zones – Irrigated Zone A (first 50-feet from the outer edge of a structure) "defensible space" that is absent of any combustible construction and Zone B (50-100 feet from the outer edge of each structure)] "fuel modification" required around all planned buildings or residential structures.
- Provide the necessary fire protection liaison with the North County Fire Protection District staff, developer/builder, engineers, architects and landscape architects.

This FPP is based upon requirements contained in the North County Fire Protection District Ordinance 2000-1 regarding Brush Clearance, requirements listed in Ordinance No. 9669, County of San Diego Fire Code effective January 30, 2008 (County Code of Regulatory Ordinances Title 9 Subsection 6 Chapter 1) and the principles discussed in the National Fire Protection Association's Standard 1144 – Standard for Reducing Structure Ignition Hazards from Wildfire. Since the original submittal, the NCFPD requires Fire Protection Plans to be submitted. This FPP has been adapted to reflect the new requirements included in their 9/2/05 guidelines to the San Diego County Fire Code.

2.0 Wildland Fire Hazard and Risk Assessment

2.1 On-site Fire Hazard and Risk Assessment

The Meadowood Project addressed in this FPP is to be located adjacent to sloping hillside terrain. The property is covered in both Sage/Buckwheat and scattered Intermediate Chaparral (See Photo No. 3). A major portion of the Project consists of an orchard that will remain in most areas on the Project perimeter. Generally the terrain within the area ranges between 5 to 60 percent slopes. The lesser steepness reflects the slope of the bottomland intermittent stream located along the western side of the Project. One existing single-family home is located along the eastern boundary of the Project site. This structure will remain following construction. This homeowner is required to maintain their property to NCFPD brush clearance standards. No grading has occurred. Direct exposure to wildland fuels will be from all sides of the property due to the presence of undeveloped land surrounding the Project.



↑ Photo 3: Looking east toward the open space. Flame lengths of over **40 feet** are likely during strong Santa Ana wind events.

The majority of the Project will be located within or adjacent to an existing citrus and avocado orchard, which is very beneficial as fire behavior and intensities will be reduced in this managed vegetation. Where the orchard is not present, the dominant vegetation consists of Sage/Buckwheat classified as Fuel Model 18, a model that contains 5.5 tons per acre of 1-hour fuels and 0.8 tons to the acre of 10-hour fuels. In isolated canyons where moisture is more available, pockets of Intermediate Chaparral (brush < six feet tall) can be found. The National Forest Fuel Laboratory (NFFL) classifies this fuel type as Fuel Model 6. FM 6 contains 1.5 tons per acre of 1-hour fuels. These two fuel types when located together are classified as a Combined Fuel Model 18/6. Wildland fire behavior and intensity in this combined fuel model will be moderate to high depending on live and dead fuel moisture levels and weather conditions.

Outside the orchard to the west the primary vegetative cover consists of cultivated fields. Left unmanaged, these would likely assume the characteristics of Intermediate Grass approximately 2 feet in height. Additionally, to the west of the proposed multi-family units in PA-1 there is biological open space. The adjacent property is proposing detention basins in this area. The Project Applicant will obtain a permanent easement for fuel management thereby establishing the required fuel modification. Enhanced-Fire Resistive Construction Features found in the County Building Code Chapter 7A and Section 5.2.8 shall be required for all structures located within the Project. When developing a FPP, the climax or forecast vegetative cover needs to be considered that would exist on the surrounding hillsides, currently consisting of an orchard. While the area today is primarily a working citrus orchard, it could over time be lost to a variety of factors including, but not limited to, lack of irrigation water, insects or disease, or economic conditions. The H.O.A. is scheduled to maintain the remaining orchard as open space. For the purposes of this FPP, a combined fuel model consisting of Sage/Buckwheat (Fuel Model 18) and Intermediate Chaparral (Fuel Model 6), brush < six feet in height, Sage/Buckwheat alone or Intermediate Grass, Fuel Model 2 will be considered for planning purposes.

The strongest winds are likely to occur from the northeast. These winds and fuels are in direct alignment with the proposed structures along the northern and eastern development boundary. To the Project's benefit, the topography is downhill which will reduce fire behavior. With fuel treatments, fire behavior and intensities will be significantly reduced.

When placing residential homes interspersed with highly flammable native and exotic vegetative fuels, the goal of this FPP is to minimize any potential loss of life, homes or personal property due to a wildland fire. Structure loss will and can be minimized by applying the following ***FIREWISE 2000, Inc.*** concepts of:

1. Requiring a Class A roof covering assembly, which includes a Class A roof covering, on all portions of each residence.
2. Placement of fire resistant (1-Hour) building materials on all residential wall surfaces that are less than 125-feet from and face highly flammable vegetation, and meet County Building Code Chapter 7A elsewhere throughout the Project.
3. Working with the developer/designer to incorporate "fire-resistive construction" throughout the Project to incorporate "enhanced fire-resistive construction" in each home and the placement of each home within the lot to minimize any threat from wildland fire.

4. Maintaining front, side and backyards to an approved North County Fire Protection District Zone A & B landscaping plant palette criteria.
5. Implementing and maintaining an irrigated 50-foot wide Setback Irrigated Zone A (low fuel volume/defensible space) that is absent any combustible construction around all residential structures.
6. Providing a strategically placed 50-foot wide Irrigated or non-irrigated Zone B long-term fire clearing area where all combustible vegetation has been removed.
7. Installing a residential fire sprinkler system in each home per NFPA 13D or 13R standards as applicable. These automatic fire sprinkler systems shall be provided throughout all dwellings and attached garages, carports, workshops, storage rooms and auxiliary use rooms.

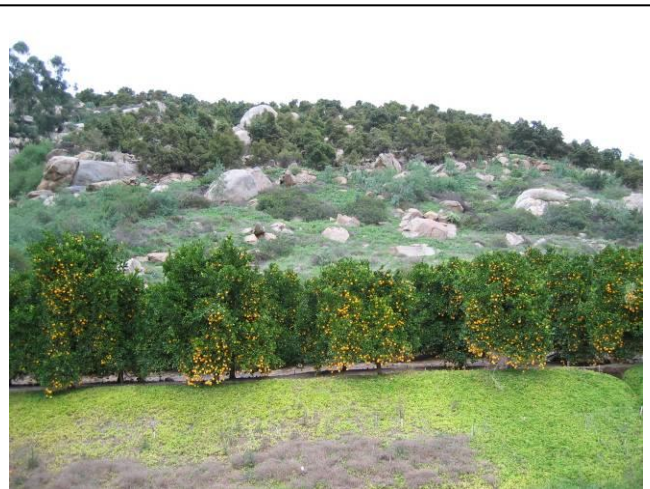
Implementing the previous mentioned fire protection concepts should more than mitigate any fire risk against wildland fire from either a strong northeast Santa Ana wind or any strong, dry prevailing southwest or south winds.

The NCFPD will require fire safe building features and fuel treatments based on the San Diego County Building Code. Specific building requirements for this Project can be found in the County Building Code 7A and are included in Section 5.2.8 of this FPP.

2.2 Off-site Fire Hazard and Weather Assessment

The vegetation surrounding the entire Meadowood Project site can be a threat to carry a fast rate-of-spread and moderate to very high intensity wildland fire from the north or east. The key to how fast, how hot and at what intensity a wildland fire will burn is directly related to wind speed and wind direction, and the age, composition and condition of burnable vegetative fuel and amount of moisture in the atmosphere. Wind direction usually determines how dry or moist (expressed as relative humidity) the air will be in the wind pattern. Local weather conditions (wind speed and live and dead fuel moistures) still are the key ingredients in determining fire intensity and rate of spread.

The most critical wind pattern to the Project area is an off-shore wind coming out of the north/northeast, typically referred to as a Santa Ana wind. Such wind conditions are usually associated with strong (> 40-MPH), hot, dry winds with very low (< 15%) relative humidity. Santa Ana winds originate over the dry desert land and can occur anytime of the year; however, they

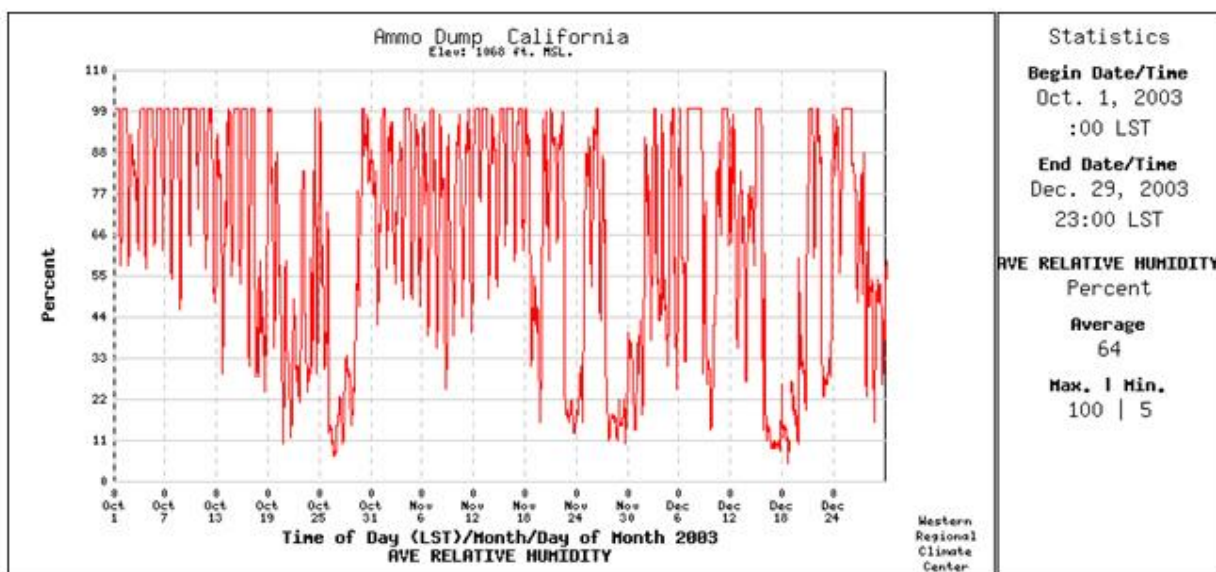


↑ Photo 4: View of the fuels to the east from proposed Street "M". The area in the background is to remain open space. Flame lengths Of **42.3 feet** Are likely during strong Santa Ana winds within the wildland fuels. Note the presence of the orchard.

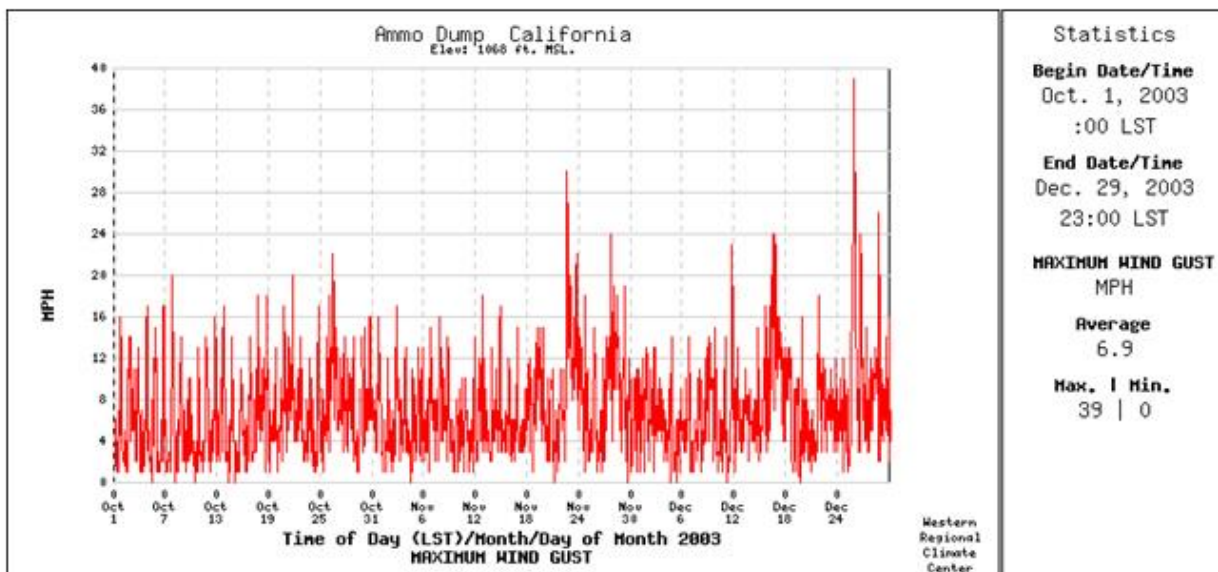
generally occur in the late fall (September through November). This is also when non-irrigated vegetation is at its lowest moisture content.

Fire agencies throughout the western United States rely on a sophisticated system of Remote Automated Weather Stations (RAWS) to monitor weather conditions and aid in the forecasting of fire danger. The closest RAWS to the Project is the Ammo Dump RAWS. The data acquired from RAWS is important to modeling wildland fire behavior. **FIREWISE 2000, Inc.** determined that the Ammo Dump RAWS is relatively new, having only been in operation since June of 2001. However, it did capture significant weather data during the major southern California fires of October 2003 as shown in Graphs 1 and 2. In reviewing the graphs, note that in late October the winds were moderately strong and relative humidity was very low, an indicator of a Santa Ana wind event. As can be seen in the graphs, this weather pattern occurred again in late November and mid-December. Note that the high winds in December were due to a winter storm as there was high relative humidity during the wind event.

Due to the fact that the Ammo Dump RAWS is relatively new, there is insufficient data that is representative of the extreme weather conditions. The RAWS is located approximately 12 miles to the west of the Project at an elevation of 1,068 feet. Data for all RAWS is archived in the Western Region Climate Center in Reno, Nevada. Weather data for August 2004 is presented in APPENDIX 'A', as an example of a typical summer day. The historic weather data was used to help determine the fuel moisture regimes found in Section 2.4, Wildland Fire Behavior Calculations For The Off-site and On-site Hazardous Vegetative Fuels.



↑ Graph 1 – Average Relative Humidity Profile – Fall 2003



↑ Graph 2 – Wind Gust Profile – Fall 2003. Note That The Spikes In Wind Speed Are Frequently Associated With Low Relative Humidity, Often Associated With Santa Ana Wind Condition.

The typical prevailing summer time wind pattern is out of the south or southwest and normally is of a much lower velocity (5-15 MPH with occasional gusts to 30-MPH) and is associated with higher relative humidity readings (> 30% and frequently more than 60%) due to a moist air on-shore flow from the ocean.

All other (northwest, south, west) wind directions may be occasionally strong and gusty: however, they are generally associated with cooler moist air and have higher relative humidity (> 40%). They are considered a serious wildland fire weather condition when wind speeds reach > 20-MPH.

A key component of this Project's FPP are the projections of expected wildland fire behavior for the existing Sage/Buckwheat, Intermediate Chaparral, Intermediate Grass and treated native and exotic fuels. Refer to Section 2.4 *Wildland Fire Behavior Calculations for the Off-site and On-site Hazardous Vegetative Fuels*, especially APPENDIX 'B' - Tables 1 through 8. Below is a discussion of the fire environment for each direction (N, E, S, and W) from where wildfire is likely to impact the Project. Fire behavior calculations are



↑ Photo 5: View to the north from the orchard maintenance road. The fuels consist of Sage/Buckwheat and scattered intermediate Chaparral in the canyons. Flame lengths of **43.8 feet** can be expected during strong Santa Ana winds.

presented for each of the four directions beginning in Section 2.4.1. Each of the fire behavior calculations is followed by appropriate mitigation measures.

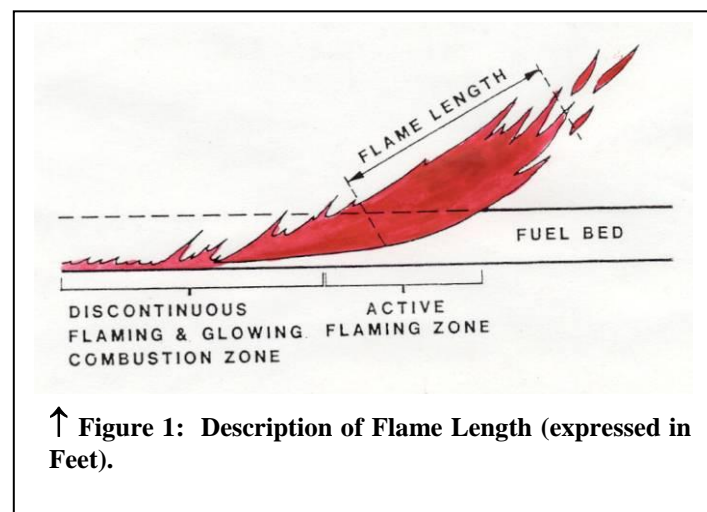
2.3 Predicting Wildland Fire Behavior.

Can wildland fire behavior really be predicted? That depends on how accurate you expect the answer to be. The minute by minute movement of a wildland fire will probably never be totally predictable, certainly not from weather conditions that were forecast many hours before the fire.

Nevertheless, practice and experienced judgment in assessing the fire environment, coupled with a systematic method of calculating fire behavior, yields surprisingly good results (Rothermel 1983).

The BEHAVE PLUS 3.0.2 Fire Modeling System by Patricia L. Andrews and Collin D.

Bevins, is one of the best systematic methods for predicting wildland fire behavior. The BEHAVE PLUS fire behavior computer modeling system was developed by USDA–Forest Service research scientists at the Rocky Mountain Research Station – Fire Sciences Lab, Missoula, Montana, and System for Environmental Management of Missoula, Montana. This modeling system is utilized by wildland fire experts nationwide. “Because the model was designed to predict the spread of a fire, the fire model describes the fire behavior only within the flaming front”.



↑ **Photo 6: Typical intermediate Coastal Sage Scrub fire behavior.**

The primary driving force in the fire behavior calculations is the dead fuel, less than one-fourth inch in diameter; these are the fine fuels that carry the fire. Fuels larger than 1/4-inch contribute to fire intensity, but not necessarily to fire spread. The BEHAVE PLUS fire model includes a model (Surface fire spread and intensity) to describe a wildfire spreading through surface fuels, which are the burnable materials within six (6') feet of the ground and contiguous to the ground. Regardless of the limitations expressed, experienced wildland fire managers can use the BEHAVE PLUS modeling system to project the expected fire intensity

(expressed as Btu/ft/sec), rate-of-spread (feet/minute) and flame lengths (feet) with a reasonable degree of certainty for use in fire protection planning purposes. Of these three fire behavior projections, flame length is the most critical in determining structure protection requirements.

The ***FIREWISE 2000, Inc.*** evaluation team used the computer based BEHAVE PLUS 3.0.2 Fire Modeling System to make nine (9) fire behavior assessments for the nearest residence to the natural brush. Seven of these were for the existing conditions and two for the recommended fuel treatments.

2.3.1 Sources of Structure Ignition. Three principal factors are responsible for structure ignitions:

- flame radiation,
- flame impingement – convection, and
- firebrands (burning embers).

Radiation and convection involve the transfer of heat directly from the flame. Unlike radiation heat transfer, convection requires that the flames contact the structure. Firebrands involve the aerial transport of burning materials to a combustible fuel receptacle (structure roofing, open vents, etc.) from vegetation or other burning materials. An ignition from radiation (given an exposed flammable surface) heat transfer depends on two aspects of the flame: 1) the radiant heat flux to a combustible surface and, 2) the duration (length of time) of the radiant flux.

The radiant heat flux depends on the flame zone size, flame-structure distance, and how much the combustible material of the structure is exposed to the flame.

Fire agencies consider vegetation management as a principal approach to wildland fire hazard reduction. Whenever the flame length, 1-2 minutes in duration or more, is equal to or more than the separation of combustible vegetation from a structure, there is a high probability of structure ignition. Contact with a fire's convection column also may cause ignition but the temperature of the column's gases are generally not hot or long enough in duration to sustain the ignition of the structure.

Firebrands - Firebrands are pieces of burning materials that detach from a burning fuel due to the strong convection drafts in the burning zone. Firebrands can be carried a long distance (one mile or more) by fire drafts and strong winds. Severe wildland/urban interface fires can produce heavy showers of firebrands. The chance of these firebrands igniting a structure will depend on the size of the firebrand, how long it burns after contact, and the type of building materials, building design, and construction features of the structure. Firebrands landing on combustible roofing and decks are common sources for structure ignition. They can also enter a structure through unscreened vents, decks and chimneys, non-metal skylights and other overhangs.

Even with non-combustible roofing, firebrands landing on leaves, needles, and other combustibles located on a roof (due to lack of maintenance) can cause structure ignition. Any open windows, doors or other types of unscreened openings are sources for embers to enter a structure during a wildland fire.

2.4 Wildland Fire Behavior Calculations For The Off-site and On-site Hazardous Vegetative Fuels

Wildland fire behavior calculations have been projected for the hazardous vegetative fuels on the undeveloped sites within, adjacent to, and bordering the proposed Meadowood Project. These projections were based on the typical prevailing southwest wind and two variations of “Worst Case” (extreme) wind conditions that could be expected within the vicinity of the Project. Live and dead fuel moisture conditions associated with these types of wind and weather conditions are as follows:

Scenario #1 - Tables 1, 2, & 6: North, Northeast and East Wind Condition Fuel Moisture Assumptions: (60-MPH Santa Ana Wind Condition). *An event often occurring two or three times a year.*

- * 1-Hour Fine Fuel Moisture of.....2%
- * 10-Hour Fuel Moisture of.....3%
- * 100-Hour Fuel Moisture of.....5%
- * Live Herbaceous Fuel Moisture of.....30%
- * Live Woody Fuel Moisture of.....50%

Scenario #2 - Table 3, 4, 5, 7, & 8: South, Southwest and West Wind Condition Fuel Moisture Assumptions: Late fire season strong non-typical (30-MPH) southwest wind pattern. *This is a rare event causing the following fuel moisture conditions, occurring only one or two times in a ten year frequency cycle.*

- * 1-Hour Fine Fuel Moisture of2%
- * 10-Hour Fuel Moisture of.....3%
- * 100-Hour Fuel Moisture of5%
- * Live Herbaceous Fuel Moisture of.....30%
- * Live Woody Fuel Moisture of.....60%

Scenario #3 – Table 3: South, Southwest and West Wind Condition Fuel Moisture Assumptions: Fuel Moisture conditions usually found under a *typical prevailing (normal summer) afternoon wind pattern.*

- * 1-Hour Fine Fuel Moisture of.....4%
- * 10-Hour Fuel Moisture of.....6%
- * 100-Hour Fuel Moisture of8%
- * Live Herbaceous Fuel Moisture of.....50%
- * Live Woody Fuel Moisture of..... 60%

APPENDIX ‘B’ - Tables 1 through 8, display the expected Rate of Fire Spread (expressed in feet per minute), Fireline Intensity (expressed in British Thermal Units per foot per second) and Flame Length (expressed in feet) for nine (9) separate BEHAVE PLUS – Fire Modeling System computer

calculations of the Meadowood Project area wildland and Zone B fuels. Following each set of calculations are mitigation measures and analysis of the fuel treatments.

2.4.1 Northern Boundary and Interior Fuels. The fuels in the undeveloped area along the Project's northern boundary and interior fuels are considered a significant wildland threat in this FPP as the development will abut both wildland and orchard vegetation that is to be retained along the grading envelope. The proposed structures will therefore be exposed to wildland fire threats directly from the north and northeast. See Photo No. 5 in reference to this area.

The native and exotic fuels and slope are in alignment with a strong north or northeast wind. The most representative fuel model is a Combined Fuel Model 18/6 [Sage/Buckwheat (70 percent) and Intermediate Chaparral, brush < 6 feet in height (30 percent)] which contains scattered pockets of exotic shrubs. A fire burning in this Combined Fuel Model can be expected to expose adjacent structures to 1-3 minutes of significant radiant and convective heat. Sage/Buckwheat is the primary carrier of wildfire. These fuels burn rapidly during hot dry weather but burn for a much shorter duration than heavier chaparral species. When developing this FPP, this factor will be considered in the mitigation measures.

FIREWISE 2000, Inc. believes that the orchard, should it be left unmanaged, would over time assume vegetative fuel characteristics of those found in the adjacent wildlands--a Combined Fuel Model. Appropriate maintenance strategies will be needed to protect future structures from wildfire.

Weather greatly influences fire behavior. The location of the Project, being on the west side of Monserate Mountain in open terrain, exposes the Project to strong north or northeast winds. Winds at the base of the Mountain would likely be only slightly less than along the ridge. As a result, extreme north or northeast Santa Ana winds of 60-MPH are utilized for planning purposes.

The topography in this area is moderately steep. Slopes of 25-50 percent are common. To the development's advantage, the adjacent slopes are downhill. Frequently there are manufactured slopes abutting the wildland fuels. These slopes will need to be replanted and maintained for not only fire protection but also soil erosion concerns.

Expected fire behavior projections for a fire burning in a Combined Fuel Model [Sage/Buckwheat – FM 18 (70 percent) and Intermediate Chaparral – FM 6 (30 percent)] during a 60-MPH Santa Ana Wind on downhill slopes of 50 percent along the northern boundary (refer to APPENDIX "B" – Table 1) are as follows:

<u>Fuel Model 18/6 (60-MPH Northeast Wind)</u>	
Rate of Spread	355 ft/min
Fireline Intensity	21,994 Btu/ft/sec
Flame Length	43.8 ft.

Mitigation: Fuel treatment along the northern portions of the Project site will require North County Fire Protection District fuel treatments of 50-feet of Irrigated Zone A followed by 50-feet of Zone B fuel treatment from each structure to mitigate against Santa Ana wind driven wildfire threats. Zones A & B treatments will need to be continuously maintained throughout the year. All treatments will be established and maintained by the builder/developer until transferred to the new lot owner or the legally formed H.O.A. for the common open space areas.

The location of the homes within the lots is unknown at the time of the development of this FPP. The design calls for each structure to be setback from the perimeter rear lot boundary a minimum of 50-feet. Zone B shall extend outward from Zone A a distance of 50-feet. Combined, a total of 100-feet of fuel treatment will result. The Meadowood Project H.O.A. shall maintain the described fuel treatments in the common open space areas and designated H.O.A. orchard. For maintenance requirements within the fuel treatment zones of the orchard, see Section 5.1.2. The lot owner shall be responsible for all fuel treatments within his or her lot.

The citrus and avocado trees in Zone B shall be irrigated, trimmed, and thinned per Section 5.1.2 of all deadwood to reduce the potential for a fire to spread into the canopy of the trees. This shall include the raising of the tree canopy and increasing the spacing between trees.

When maintained to the criteria described above (Zone A and B), the fuel treatments should adequately protect each structure from the forecast **43.8 foot** flame lengths. All homes will have the “Fire-Resistive Building Features” described in Section 5.2.8.

The major and secondary means of access as described in Section 5.6 are very important to both emergency responders and local residents. They are the means for safe ingress and egress. To further protect roadways within the development, roadway fuel treatment shall be established and maintained to the criteria described in Section 5.2.6 or 5.2.7 depending on the roads location. This treatment shall be applied to Streets “D” and “E” and the secondary access road that is to be located at the northern end of the project and extend to the east.



↑ **Photo 7: View toward the eastern boundary from near proposed Street “M”, the primary means of access. Note the steep topography and Sage/Buckwheat with grass vegetation. Orchards are located to the left and right of the photo.**

All the fuel treatments described above along the northern lot boundary or perimeter can be established within the Project.

2.4.2 Eastern Boundary and Interior Fuels. Wildland and grove vegetative fuels are located along the entire eastern boundary of the Project as shown in Photo No. 7. ***FIREWISE 2000, Inc.*** is assuming that the current groves are likely over time to revert to Sage/Buckwheat vegetation due to economic or water availability concerns. The primary areas of concern are the homes located on the perimeter of the Project adjacent to downhill slopes that are covered with either wildland fuels or orchards. The Meadowood property is therefore exposed to wildland fire threats from the east.

The native and exotic fuels are in alignment with a north or northeast wind. The fuel model that best describes the vegetative cover is a Sage/Buckwheat - FM 18. Slopes of 30-55 percent are common. These slopes are downhill to the proposed structures, which is beneficial. For the purposes of this analysis, projections are made for an extreme Santa Ana Wind of 60-MPH as there is little or no protection resulting from either topography nor an overtopping tree canopy.

Expected fire behavior projections for a fire burning in vegetative fuels consisting of Sage/Buckwheat – FM 18 during a 60-MPH Santa Ana wind with slopes of 55 percent along the eastern boundary (refer to APPENDIX ‘B’ - Table 2) are as follows:

Fuel Model 18 (60-MPH Northeast Wind)

Rate of Spread	265 ft/min
Fireline Intensity	19,269 Btu/ft/sec
Flame Length	42.1 ft.

Mitigation: Fuel treatment along the eastern portions of the Project site will require North County Fire Protection District fuel treatments of 50-feet of Irrigated Zone A followed by 50-feet of Zone B fuel treatment from each structure to mitigate against Santa Ana wind driven wildfire threats. Zones A & B treatments will need to be continuously maintained throughout the year. All treatments will be established and maintained by the builder/developer until transferred to the new lot owner or the legally formed H.O.A. for the common open space areas.

The location of the homes within the lots is unknown at the time of the development of this FPP. The design calls for each structure to be setback from the perimeter rear lot boundary a minimum of 50-feet. Zone B shall extend outward from Zone A a distance of 50-feet. Combined, a total of 100-feet of fuel treatment will result. The Meadowood Project H.O.A. shall maintain the described fuel treatments in the common open space areas and designated H.O.A. orchard. The lot owner shall be responsible for all fuel treatments within his or her lot.

The citrus and avocado groves in Zone B shall be irrigated, trimmed, and thinned per the criteria established in Section 5.1.2 of all deadwood to reduce the potential for a fire to spread into the canopy of the trees. This shall include the raising of each tree canopy and increasing the spacing between trees.

For the school site, an off-site fuel treatment agreement zone (described in Section 5.2.3) will need to be established with the adjacent landowner. This zone shall be 70 feet in width and maintained to Zone B criteria found in Section 5.1.2. As the location of the school buildings within the lot are unknown, this plan requires that the buildings be setback from the eastern property line a minimum of 50 feet to allow for the establishment of Irrigated Zone A within the lot.

The major and secondary means of access within the Project are very important to both emergency responders and local residents. They are the means for safe ingress and egress. This requirement shall apply to Horse Ranch Creek Road, Street “A” and “C”. A portion of Horse Ranch Creek Road will require an off-site fuel treatment agreement with the adjacent property owner. The agreement shall be established and maintained per the criteria found in Section 5.2.7. Roadside fuel treatment shall be performed within 30 feet of the roadway edge for new roads and within 20 feet of the roadway edge for existing roads. Roadside fuel treatments shall be maintained to the criteria found in the County Fire Code and included in Section 5.2.6.

When maintained to the criteria described above (Zone A and B), the fuel treatments should adequately protect each structure from the forecast **42.1 foot** flame lengths. All homes will have the Enhanced Fire-Resistive Building Features described in Section 5.2.8.

2.4.3 Southern Boundary and Interior Fuels. The fuels in the undeveloped area along the Meadowood Project southern boundary are considered in this FPP as the development will abut wildland vegetation as shown in Photo No. 7. The proposed structures will be exposed to wildland fire threats directly from the south. The Meadowood Project Homeowners Association will be responsible to ensure that brush clearance regulations are maintained, throughout the community including the nearby single family home located south of the cul-de-sac at the end of Street “A” with a statement of compliance sent to NCFPD.

The new design results in a road being installed along nearly all the southern edge of the multi-family area. This road is required to service the water treatment facility located to the west. This road will exceed Zone B fuel treatment requirements.



↑ **Photo 8: View of the southern boundary fuels. Note The lack of heavier chaparral species, steep topography and rocky terrain.**

The fuels and upslope topography are all in alignment with a west or southwest wind pattern. The most representative fuel model is Fuel Model 18, Sage/Buckwheat. The topography in this area is nearly level to moderately steep. Slopes of 3-60 percent are common. For the purposes of this analysis, projections are made for both a “rare event” 30-MPH dry southwest

wind and a “typical summer day” with winds of 10-MPH. This strong dry southwest wind may only occur once in a decade but it will occur.

Projected fire behavior calculations for a fire burning in Sage/Buckwheat (FM 18) on slopes of 60 percent along the southern boundary during a “*rare event*” 30-MPH wind and a “*typical summer day*” with winds of 10-MPH (refer to APPENDIX ‘B’ – Table 3) are as follows:

Fuel Model 18 (30-MPH Southwest Wind)

Rate of Spread	166 ft/min
Fireline Intensity	11,966 Btu/ft/sec
Flame Length	33.8 ft.

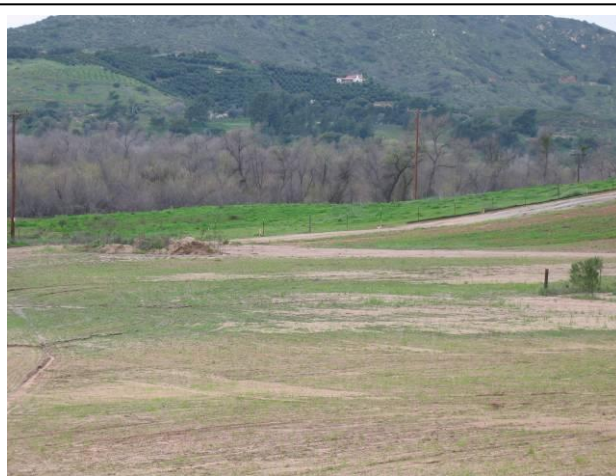
Fuel Model 18 (10-MPH Southwest Wind)

Rate of Spread	58 ft/min
Fireline Intensity	3,650 Btu/ft/sec
Flame Length	19.6 ft.

Mitigation: Fuel treatment along the southern portions of the Project site will require North County Fire Protection District fuel treatments of 50-feet of Setback Irrigated Zone A followed by 50-feet of Zone B fuel treatment from each structure to mitigate against Santa Ana wind driven wildfire threats. Zones A & B treatments will need to be continuously maintained throughout the year. All treatments will be established and maintained by the builder/developer until transferred to the new lot owner or the legally formed H.O.A. for the common open space areas.

The location of the homes within the lots is unknown at the time of the development of this FPP. The design calls for each structure to be setback from the perimeter rear lot boundary a minimum of 50-feet. Zone B shall extend outward from Zone A a distance of 50-feet. Combined, a total of 100-feet of fuel treatment will result. The Meadowood H.O.A. shall maintain the described fuel treatments in the common open space areas and designated H.O.A. orchard. The lot owner shall be responsible for all fuel treatments within his or her lot.

The citrus and avocado groves located in Zone A and B shall be irrigated, trimmed, and thinned per the criteria established in Section 5.1.2 of all deadwood to reduce the potential for a fire to spread into the canopy of the trees. This shall include the raising of each tree canopy and increasing the spacing between trees. These groves are found on the interior of the Project.



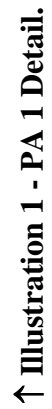
↑ Photo 9: Looking west along the proposed access roadway Horse Ranch Creek Road. Future development is currently being planned. Roadside fuel treatment will be required to protect resident igress.

The major and secondary means of access within the Project are very important to both emergency responders and local residents. They are the means for safe ingress and egress. To further protect the secondary means of access roadway located on the southern boundary, roadway fuel treatment shall be established and maintained along Streets “A”, “B”, “I”, “K” and “Q” to the criteria described in Section 5.2.6 or 5.2.7 as appropriate.

2.4.4 Western Boundary and Interior Fuels. The Meadowood Project’s western boundary is generally located adjacent to cultivated fields for the northern single family homes. Additionally, several existing structures located on the west side of the road labeled Horse Ranch Creek Road that will be removed for the construction. The southern half of the development area includes multi-family homes and a planned school. These multi-family homes will be limited to two stories in height. As shown in Photo No. 9, to the west of the cultivated fields is an area of riparian vegetation dominated by cottonwood and willow trees. This is located several hundred feet west of the detached single family home area. Further to the south, the vegetation is in close proximity to the multi-family homes, a portion of which is riparian habitat. A portion of this riparian vegetation is protected and therefore no fuel treatment can occur within its boundaries.

Vegetative fuels along the western boundary as shown in Photo No. 9 are lighter than those found on the north, east or southern boundary, due to frequent disturbances. The area would likely support Intermediate Grass of 2 feet in height, Fuel Model 2 if left unmanaged. The fuels are located on nearly level to slightly sloping topography of 3-15 percent.

It is also reported that the area to the west of the multi-family homes is scheduled to be developed as shown in Illustration 1 on the following page. Note in this illustration are the locations of the roads, trail, and noise barriers.



The greatest weather concern along the western boundary is a “rare event” hot dry wind of 30-MPH. This wind only occurs on average once every decade. The typical prevailing summer time wind pattern is out of the south or southwest and normally is of a much lower velocity (5-15 MPH with occasional gusts to 30-MPH) and is associated with higher relative humidity readings (> 30% and frequently more than 60%) due to a moist air on-shore flow from the ocean.

Projected fire behavior calculations for a fire burning along the western boundary near the detached single-family homes in Intermediate Grass (FM 2) on slopes of 15 percent during a “rare event” 30-MPH southwest wind (refer to APPENDIX ‘B’ – Table 4) follow:

Fuel Model 18 (30-MPH Southwest Wind)

Rate of Spread	314 ft/min
Fireline Intensity	3,409 Btu/ft/sec
Flame Length	19.0 ft.

Projected fire behavior calculations for a fire burning west of the western boundary of PA - 1 in fuels best classified in Scott and Burgan, 2005 as a combined fuel model of a Very High Load Broadleaf Litter or Tl9 (70 percent) and Fuel Model 18 Sage/Buckwheat (30 percent) (refer to APPENDIX ‘B’ – Table 5):

Fuel Model tl9/18 (30-MPH Southwest Wind)

Rate of Spread	65 ft/min
Fireline Intensity	8,671 Btu/ft/sec
Flame Length	29.2 ft.

For PA-1, based on the projected fire behavior, a crown fire could develop in the riparian vegetation especially in areas with high accumulations of dead material located in the tree canopy. Such a fire would produce flames approximately equal to the tree heights.

Mitigation: Fuel treatment along the western portions of the Project site will require North County Fire Protection District fuel treatments of 50-feet of Setback Irrigated Zone A followed by 50-feet of Zone B fuel treatment from each structure to mitigate against Santa Ana wind driven wildfire threats. Zones A & B treatments will need to be continuously maintained throughout the year. All treatments will be established and maintained by the builder/developer until transferred to the new lot owner or the legally formed H.O.A. for the common open space areas.

For PA-5 the location of the detached single family homes within the lots is unknown at the time of the development of this FPP. The design calls for each structure to be setback from the perimeter rear lot boundary a minimum of 20-feet. Zone B shall extend outward from

Zone A a distance of 50-feet. Combined, a total of 100-feet of fuel treatment will result adjacent to the detached single-family homes. The Meadowood Project H.O.A. shall maintain the described fuel treatments in the common open space areas. The lot owner shall be responsible for all fuel treatments within their lot.

Within the interior of the project is an island of citrus or avocado trees located in Zone B. This area shall be trimmed, and thinned per the criteria established in Section 5.1.2 of all deadwood to reduce the potential for a fire to spread into the canopy of the trees. This shall include the raising of each tree canopy and increasing the spacing between trees.

The major access roads into the Project (Horse Ranch Creek Road, Pala Mesa Drive Crossing (Street “R”) and Pala Mesa Heights Drive) are very important to both emergency responders and local residents. They are the primary means of ingress and egress. To further protect these roadways, roadway fuel treatments shall be established and maintained to the criteria described in Sections 5.2.6 and 5.2.7 as appropriate.

All the fuel treatments described for the detached single family homes above along the western lot boundary or perimeter can be established within the Project with an exception for lots 154-171. A temporary 100-foot off-site fuel treatment agreement needs to be established as shown on the Fire Protection Plan Map - Section 6.0 and Illustration 2. A temporary off-site fuel treatment agreement needs to be established to the west of the multi-family areas (PA-1 and PA-4) until the adjoining area is developed (proposed commercial area located south of Pala Mesa Drive Crossing also known as Street “R”). The fuel treatment within these off-site areas needs to be maintained to a four-inch stubble height until such time as the property is developed (see Section 6.0).

For PA-1, the location of the detached multi-family homes within the lots is unknown at the time of the development of this FPP. PA-1 is bisected by Street R such that Lots 356-400 are located within the portion of PA-1 which is north of Street R, and Lots 401-519 are located within the portion of PA-1 which is south of Street R. The design calls for each structure located within PA-1 North, to be setback from the western project boundary a minimum of 50-feet. The combination of on-site fuel treatments in conjunction with off-site fuel treatment on the Campus Park property will provide for 100 feet of fuel treatment within PA-1 North. To the west of the most northern portion of PA-1 North is a detention basin on the adjacent Campus Park property. Pardee Homes will obtain an easement across this property, and the Campus Park HOA will provide for the maintenance of this detention basin. In the absence of maintenance by the Campus Park HOA, Pardee Homes will provide maintenance, ensuring fire-resistant landscaping is maintained.

For PA-1 South, the design calls for the structures to be located as close as 10-feet from the western project boundary. A 100-foot wide temporary off-site fuel treatment agreement will need to be established as shown on the Fire Protection Plan Map – Section 6.0.

2.5 Summary of Fire Behavior In Untreated and Treated Vegetation

Below are the worst case fire behavior calculations followed by the projected fire behavior in the treated fuels.

TABLE 2.5A – 60-mph Northeast Wind
Northern Exposure to wildfire

Prior to Fuel Treatment

Rate of Spread	355 ft/min	VS.
Fireline Intensity	21,994 Btu/ft/sec	
Flame Length	43.8 ft.	

TABLE 2.5D - 60-mph Northeast Wind
(APPENDIX B, Table 6)

After Fuel Treatment

Rate of Spread	41 ft/min
Fireline Intensity	67 BTU/ft/sec
Flame Length	3.1 Feet

TABLE 2.5B – 30-mph Southwest Wind
South Exposure to wildfire

Prior to Fuel Treatment

Rate of Spread	166 Ft/min	VS.
Fireline Intensity	11,966 BTU/ft/sec	
Flame Length	33.8 Feet	

TABLE 2.5E – 30-mph Southwest Wind
(APPENDIX ‘B’, Table 7)

After Fuel Treatment

Rate of Spread	41 ft/min
Fireline Intensity	67 BTU/ft/sec
Flame Length	3.1 Feet

TABLE 2.5C - 30-mph Southwest Wind
Streambed West of PA-1 and South of
Pala Mesa Drive Crossing

Prior to Fuel Treatment

Rate of Spread	65 Ft/min	VS.
Fireline Intensity	8,671 BTU/ft/sec	
Flame Length	29.2 Feet	

TABLE 2.5F – 30-mph Southwest Wind
(APPENDIX ‘B’, Table 8)

After Fuel Treatment in Zone C

Rate of Spread	36 ft/min
Fireline Intensity	700 BTU/ft/sec
Flame Length	9.2 Feet

3.0 Assessing Structure Ignitions in the Wildland/Urban Interface (Intermix)

During periods of high fire intensity and strong, dry winds, convective firebrands have the capability of being transported over great distances. The likelihood of a structure loss from airborne embers is not a big concern for the proposed Meadowood Project, as the homes will be constructed with non-combustible roofing and non-combustible or heavy timber building materials where designated, as per the County of San Diego Fire Code.

Each homeowner will be responsible for maintaining his or her home, keeping the roof and rain gutters free of leaves, needles and other combustible debris and all firewood and other combustible materials are properly stored 30-feet away from each structure so that burning embers falling on or near a structure have no suitable host.

“*Firewise landscaping*” is the act of converting native vegetation from a highly flammable and high intensity state to a much more fire resistant and lower fire intensity condition. For purposes of this analysis, the Zone B landscape is deemed equivalent in fire behavior to a sparse short dry climate grass.

Comparing the expected wildland fire behavior projections of untreated Combined Fuel Model [FM-18, Sage/Buckwheat (70%) and FM-6 Intermediate Chaparral - brush < six feet in height (30%)] as

depicted in Table No. 2.5A against the proposed fire resistant landscape vegetation within the designated Zone B, 50-foot wide fire resistant planting area, (as depicted in Table No. 2.5D) demonstrates substantial reductions in the expected flame length and fireline intensity.

By requiring each structure to be constructed of non-combustible roofing and building materials, the implementation of a 50-foot wide Irrigated Zone A (defensible space) immediately adjacent to a structure, plus the additional 50-foot wide Zone B around the structure proves to be the most effective treatment for minimizing structure losses due to the projected **43.8** foot flame lengths and associated radiant heat intensities.

Fire intensity in Fuel Model 18 Sage/Buckwheat along the northern development boundary has expected flame lengths of **43.8 feet** for a 60-MPH Santa Ana Wind event (APPENDIX 'B' - Table 2). In contrast, flame lengths in these same treated fuels will approach **3.1 feet** during a 60-MPH downslope Santa Ana wind and will require fuel treatment of 100 feet from the structure, APPENDIX 'B' - Table 6. Therefore, a 50-foot Irrigated Zone A followed by 50 feet of Zone B treatments implemented around each structures adjacent to a Fuel Model 18 will be more than adequate.

Fire intensity along the southern development boundary for a fire burning in a FM 18 – Sage/Buckwheat during a 30-MPH “rare event” south or southwest wind has expected flame lengths of **33.8 feet** (Table No. 2.5B). A fire burning in the same area under the same conditions in treated fuels (Zone B) has flame lengths of **3.1 feet**, Table No. 2.5E. Therefore, the establishment of a 50-foot wide Irrigated Zone A followed by a 50-foot wide Zone B adjacent to each structure will be more than adequate to protect each home from radiant and convective heat from wildfire.

Additionally, all structures shall be protected through not only fuel treatment but the Enhanced Fire-Resistive Construction Features included in the County Building Code and found in Section 5.2.8.

4.0 Fire Department Emergency Response Travel Times

The Meadowood residences will be within a 5 minute initial travel time for NCFPD Station #4 located at 4375 Pala Mesa Drive once Pala Mesa Drive is extended to SR76 and the connecting Street “R” is constructed to Horse Ranch Creek Road (see Section 5.6 especially Illustration 2 for additional information on planned roads). When the roads are constructed, this station will be within a 5 minute travel time of all buildings within the proposed development. The next closest engine is the NCFPD Engine #6 located at 2309 Rainbow Valley Blvd. It is approximately four miles from the proposed homes and nearly 6-10 minutes away depending on the time of the incident and traffic conditions. This station is staffed by the Rainbow Volunteers, which may result in a delayed response as volunteers typically respond from their home or work locations. The third closest station is NCFPD Engine #5 located at 31403 Old River Road. This engine is approximately 8-12 minutes away from the proposed Project. Additional Pala Reservation Fire Department and California Department of Forestry and Fire Protection (CAL FIRE) engines can be requested to respond, under either Automatic Aid or the State Mutual Aid Agreement. These firefighting resources are approximately 12-30 minutes away from the Project site. Nevertheless, given the reality that when a wildfire occurs on southern California wildlands, there are usually multiple fires occurring and fire fighting resources can be quickly drawn down and unavailable for extensive periods of time as additional new fires occur.

Although NCFPD fire station #4 or #6 engines may be generally 3-10 minutes away, there is absolutely no assurance that either Engine Company will be in their station on the day a wildfire threatens the Project. On high/extreme fire danger days there often may be multiple starts and engine companies may be already deployed on other incidents. This is why ***FIREWISE 2000, Inc.*** planned developments use “*defensible space*”, Basic Fire-resistive Construction and Enhanced Fire-resistive Construction Features included in the County Building Code, and key fuel treatment strategies that enable residents to survive a wildfire on their own and without the loss of their structure or lives. Typically, fire districts prefer residents to evacuate when there are several existing routes of travel, as are available in this project.

5.0 Fuel Modification Descriptions, Recommended Treatments And Infrastructure

A landscape plan shall be submitted to and approved by the NCFPD Fire Marshal prior to the framing inspection. The landscape plan shall be consistent with this FPP and comply with Section 4707.4 of the County Fire Code regarding landscape plans.

5.1 Fuel Modification Descriptions

Below are descriptions of the desired fuel modification treatments for the Project. To further mitigate wildfire impacts, the H.O.A. shall prune trees and shrubs that are established in a common area, fuel treatment easement or fuel modification agreement area free of all deadwood, remove the tree canopy that overtops any portion of a structure and thin the canopy to maintain the vegetation to ANSI A300-1995 – Standard For Tree Care Operations, Tree, Shrub, And Other Woody Plant Maintenance standards. By maintaining the vegetation to this standard, improved health and vigor will be obtained while enhancing fire resistance.

Interlinking of both on-site and off-site fuel treatment zones is required to protect all the structures within the development from wildfire. All measurements below are horizontal distances unless otherwise described.

5.1.1 Irrigated Zone A.

Defined:

Zone A comprises the first 50-feet around a structure (front, back and side yards) and is commonly called the defensible space zone for fire suppression forces and to protect structures from radiant and convective heat. It is an irrigated zone and shall be free of all combustible construction, firewood, propane tanks, fuel, flammable native or ornamental vegetation and materials for a distance of 50-feet from each structure. Examples of non-combustible building materials can be found in APPENDIX ‘F’.

Required Landscaping:

Zone A will be cleared of all existing native vegetation except protected species such as oaks. Zone A will then be replanted with drought tolerant and irrigated fire resistant lawns, ground covers and shrubs. Landscaping shall be permanently irrigated and primarily consist of fire resistant, maintained native or ornamental plantings usually less than 18 inches in height. However, this zone may contain occasional fire resistant trees and single well spaced

ornamental shrubs up to 48 inches in height, intermixed with ground covers and lawn. Shrubs and ground covers may be located no closer than five feet from the structure provided these plants will not carry fire to the structure. Non-flammable concrete patios, driveways, swimming pools, walkways, boulders, rock, and gravel can be used to break up fuel continuity within Zone A. As all homes are to be located within 50 feet of curbs, driveway fuel treatment requirements of Irrigated Zone A shall automatically be met.

Lot Y in PA 1 contains an archeological site. To protect the site, an earthen cap of 2-3 feet (6 inches of clean sand under 1.5-2.5 feet of clean fill dirt) over a geofabric is to be installed. The irrigation lines shall not be installed more than 2 feet below the soil surface to protect the archeological resource. Should additional information be required, consult with the project engineer, Rick Engineering of San Diego.

Plants in this zone need to be fire resistant and should not include any pyrophytes that are high in oils and resins such as pines, eucalyptus, cedar, cypress or juniper species. Thick, succulent or leathery leaf species with high moisture content are the most “fire resistant”. Refer to APPENDICES ‘C’ & ‘D’, County of San Diego’s Desirable Plant List and Prohibited Plants for plant selection.

Trees must be planted so that when they reach maturity the tips of their branches are at least 10 feet away from any structure including chimneys. There also must be a minimum of six feet of vertical separation from low growing irrigated vegetation beneath the canopy of the tree.

Landscape plants from the approved list (trees and shrubs) are to be spaced as follows:

1. Slopes 0-20%---2 times height of mature plant.
2. Slopes 21-40%---4 times height of mature plant.
3. Slopes > 40%---6 times height of mature plant.

Required Maintenance:

Each lot shall be maintained year round by the individual property owner(s) within their property boundaries (lot lines) as required by this FPP or the NCFPD. Shrubs and trees are to be annually maintained free of dead material. Trees will be maintained so that their crown cover will be more than ten (10) feet from any structure. All tree crowns will be separated by twenty (20) feet and maintained to keep a separation of 6 feet between the ground fuels (shrubs and ground covers) and the lower limbs. All trees must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)*]. For additional information see this web site: http://www.treecareindustry.org/public/gov_standards_a300.htm.

5.1.2 Zone B.

Defined: Zone B is an area between 50 and 100 feet from the structure beginning at the outer edge of Zone A and may include both manufactured and natural slopes. It is permanently irrigated, partially, or non-irrigated, depending upon the plant species selected, and includes all natural and manufactured slopes. When Zone B includes an existing grove of trees set aside for agricultural purposes, a minimum of 50 percent of the trees must be removed from

the Zone B and those trees that remain shall be irrigated. Trees are to be maintained free of down and dead materials and limbed up one third the height of the tree. On sloping land, additional separation between trees is required per the description below.

Required Landscaping

All flammable native plants (see San Diego County prohibited plant list in Appendix "C") shall be removed with the resulting 50 feet of treated area permanently irrigated, temporarily irrigated, or non-irrigated and replanted with low growing (maximum 12 inches in height) and low fuel volume "ground cover" vegetation or native grasses and occasional well spaced (separated by a minimum of twenty (20) feet), low growing (maximum height 15 feet) fire resistant trees (see APPENDIX 'D').

Water conservation practices within this zone may include drip irrigation and methods of erosion control to protect against slope failure. Should landscaping be desired in a Zone B, landscape plant materials shall consist of plants from the approved plant list found in APPENDIX 'D'.

Existing trees or new tree plantings that are in groves in a Zone B shall be maintained as noted for Zone A and spaced as follows:

1. Slopes 0-20%--40' centers.
2. Slopes 21-40%--50' centers.
3. Slopes > 40%--60' centers.

Tree and shrub spacing in landscaped areas outside of groves and designated agricultural areas shall be as per Zone A criteria.

Required Maintenance: All remaining native specimen plants shall be maintained to a height of up to 18" and the native trees and aborescent native shrub species, (such as oaks, Mexican elderberry, toyon, mission manzanita, and laurel sumac that are over 6 feet in height and can be formed as mature trees) shall be trimmed up six feet from the ground. Trees in Zone B must be separated per the slopes described above. All of the dead material must be pruned out on an as-needed basis, but at least annually each spring. Tree litter (duff) may remain under groves up to six inches in depth.

Should a lot owner or the H.O.A. desire to plant vegetation within this zone and irrigate it until established, they shall be from the approved plant list and meet the maintenance requirements contained herein.

Existing Groves: A significant portion of the fuel treatment will occur within existing citrus and avocado groves. The ground cover, native and exotic plants and grasses, and leaves *below the tree canopies* shall be weed whipped or mowed and maintained at a height of six inches. Open areas resulting from exotic or fire prone plant removal (root system to be left intact) may be hydroseeded with a mix of native annual and perennial grasses. These grasses will be allowed to grow and produce seed during the winter and spring. As grasses between trees begin to cure (dry out), they will be cut to four inches or less.

Trees will be limbed up one third of height of tree and all dead leaves shall be removed.

Products of tree pruning and thinning operations may be removed from the site, chipped and spread or multi-cut into lengths of no greater than 8 inches and scattered so that they do not exceed a depth of more than 4 inches.

Should water for irrigation be temporarily removed, the groves shall be assessed bi-monthly by a person knowledgeable in tree health and any dead or dying trees immediately removed including flammable understory vegetation.

Should water for irrigation be permanently removed, the grove area shall fully conform with Zone B criteria for non-grove areas. This will require the removal of the trees and the area maintained to the Zone B criteria described above.

It is highly recommended that the H.O.A. hire a grove operator/maintenance specialist and develop a management plan for the entire grove operation. This plan would specify detailed information concerning maintaining the health and productivity of the trees and their long term management. This plan shall be consistent with the approved Fire Protection Plan.

5.1.3 Thinning Zone C (H.O.A. Maintained).

Defined: Zone C is a non-irrigated area that typically includes both Manufactured and Natural slopes located within 100 feet of structures on off-site areas west and south of the multi-family homes and south of Pala Mesa Drive Crossing “Street R” (see Section 6.0). The zone east of the school site on the adjacent land shall be 70 feet in width.

Required Maintenance: These areas will be maintained by the H.O.A. The plants found in the Undesirable Plant List found in APPENDIX ‘C’ shall be removed from Zone C and will not be permitted to regrow on manufactured or natural slopes that are part of this plan. The remaining low growing shrubs and ground covers are to be maintained to a height of 12 inches or less. Each tree will be limbed to maintain a separation of 6 feet between the ground fuels (shrubs and ground covers) and the lower limbs. Native annual and perennial grasses located beneath trees and around shrubs/ground covers will be allowed to grow and produce seed during the winter and spring. As these grasses begin to cure (dry out), they will be cut to 4 inches or less in height.



↑Photo 10 – Typical example of a landscaped manufactured slope that is irrigated.

The ground cover, native plants and grasses, below tree canopies in landscaped areas shall be weed whipped and maintained at a height of 4 inches or less. Between tree canopies, grass and ground covers shall be maintained to a four-inch stubble height. To maintain erosion

control and soil stability, establish low growing, fire resistive, drought tolerant plants from the approved plant list found in APPENDIX 'D'.

5.1.4 Manufactured Slopes Common Areas (H.O.A. Maintained).

Temporarily irrigated, irrigated and maintained slopes are to be planted with fire resistant vegetation (see Photo No. 10). Maintenance of these manufactured slopes will be the responsibility of the individual homeowners within the lot boundary and the developer and/or builder outside each lot boundary. Once a H.O.A. is legally formed, then this responsibility will be transferred to the H.O.A. Long-term maintenance will meet the Fuel Modification Zone C criteria when the slope is over 100 feet from a structure. An example of an irrigated manufactured slope can be seen in Photo No. 10. Should a Manufactured Slope Common Area exist within a designated Zone A (within 50 feet of a structure) or Zone B (within 50-100 feet of a structure) fuel treatment zone then that portion of the slope will be maintained to Irrigated Zone A or B criteria as found in Section 5.1.1 or 5.1.2.

5.2 Required Fuel Treatments and Actions

The following describe the various fuel treatments and where the required additional Enhanced Fire-Resistive Construction Features are required to protect life, property and natural resources identified on the Fire Protection Plan Map (see Section 6.0).

5.2.1 Lot Front, Side and Backyards. *(Not depicted by a color on the Fire Protection Plan Map).*

Each individual lot owner will be required to maintain their front, side and backyards within 50-feet of the structure to irrigated “firewise” Zone A landscaping or to the lot boundary. Any remaining portion of the backyard, front or side yard will be maintained to either Zone A or Zone B criteria depending on the position of the structure within the lot (see Section 5.1.1 and 5.1.2). Where Irrigated Zone A cannot be established within the Project, the Enhanced Fire-Resistive Construction Features described in Section 5.2.8 shall be required. The multi-family housing area shall be equivalently maintained by the H.O.A.

5.2.2 Irrigated Common Area – H.O.A. Maintained. *(Shown as Blue on the Fire Protection Plan Map).*

Irrigated and firewise planted landscape meeting Fuel Modification Zone A criteria described in Section 5.1.1. The Meadowood Project H.O.A. shall be responsible for the maintenance of this fuel treatment zone that is also identified as a limited building zone. See Fire Protection Plan Map – Section 6.0.

5.2.3 Natural/Manufactured Slopes - H.O.A. Maintained. *(Shown as Orange on the Fire Protection Plan Map).*

Fuel treatment areas where all native or existing vegetation including any newly planted ornamental landscaping will be maintained to Zone C criteria by the H.O.A on ground that is either located within the common area or on adjacent property outside the project. When the area is located on adjacent property, a fuel treatment agreement shall be established with the adjacent landowner that will allow the area to be maintained. Contour foot access trails, concrete drainage structures or roadways should be provided to aid in annual maintenance of these common areas. The distance between maintenance access points shall not exceed 500 feet.

5.2.4 Manufactured Slopes Common Areas - H.O.A. Maintained. (*Shown as Dark Green on the Fire Protection Plan Map*).

Landscaping and maintenance will be to the criteria described in Section 5.1.4. These areas may be irrigated, temporarily irrigated ornamental Firewise landscaping, or planted with native fire resistant plants and trees (see APPENDIX 'D'). The zone will often include areas within debris basins. When a portion of the manufactured slope lies within 100 feet of a structure, Zone A and B design and maintenance criteria shall apply. Maintenance shall be performed annually by the H.O.A.

5.2.5 Special Fuel Modification Agreement Zones – H.O.A. Maintained. (*Shown as Red on the Fire Protection Plan Map*).

A temporary off-site fuel treatment zone where the adjacent landowner is planning to develop their property. The H.O.A. shall perform the required maintenance until such time as the adjacent property is developed. At that time, the adjacent owner shall assume responsibility for this fuel treatment zone. The adjacent owner has agreed to allow fuel treatment equivalent to weed whacked 4 inch stubble height grass and related herbaceous vegetation or where the vegetation is maintained to Zone C criteria described in Section 5.1.3. An example of a Fuel Modification Agreement can be found in APPENDIX 'G'. The zone shall be 90 feet in width adjacent to multi-family structures and a minimum of 40 feet in width adjacent to single family homes. See Fire Protection Plan Map, Section 6.0.

5.2.6 Roadside Fuel Treatment – H.O.A. Maintained. (*Shown as Purple on the Fire Protection Plan Map*).

All new publicly accessible roads within the Meadowood Project development shall have roadside fuel treatment for a minimum of 30-feet measured from the edge of the pavement on both sides of the roadway prism. Fuel Treatment starting at the edge of the pavement will consist of Irrigated Zone A as described in Section 5.1.1. The purpose of this action is to minimize the cutting-off of the home owners egress due to a wildland fire occurrence and for safe ingress by emergency responders. Roadside fuel treatment along existing roads shall be cleared of all flammable vegetation for a distance of 20 feet from the edge of the paved road surface.

Trees and related vegetation planted along roadways shall be pruned to maintain 13' 6" nominal vertical clearance over the entire width of all means of access per the San Diego County Fire Code.

5.2.7 Roadside Fuel Modification Agreement Zones – H.O.A. Maintained. (*Shown as Grey on the Fire Protection Plan Map*).

Fuel Treatment area shown on the Fire Protection Plan Map (Section 6.0) that is owned by an adjoining property owner and maintained by the Meadowood Project H.O.A to Zone A criteria or cleared of all combustible vegetation pursuant to an agreement until such time as the adjacent property is developed. The zone shall extend outward 30 feet from the roadway edge. The purpose of this action is to minimize the cutting-off of the home owners egress due to a wildland fire occurrence and for safe ingress by emergency responders.

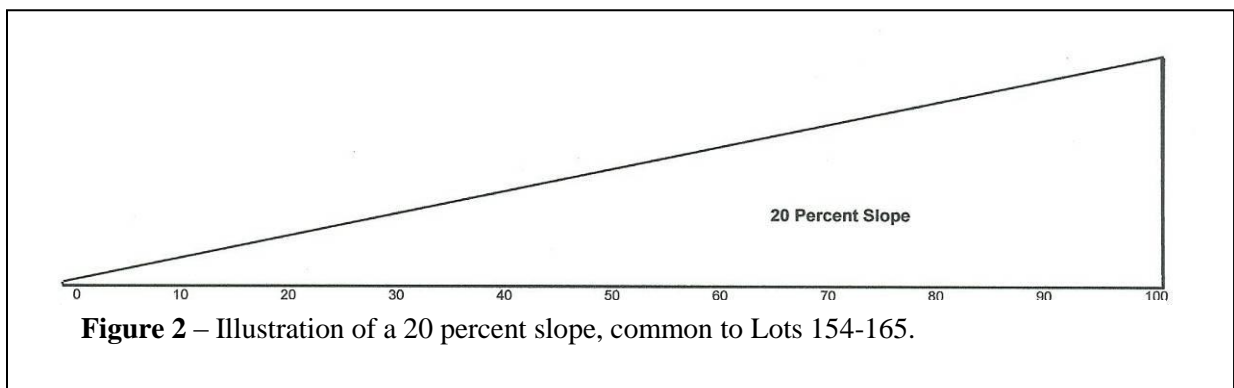
5.2.8 Fire-Resistive Construction Features.

As of the date of this FPP the San Diego County requirements for “basic” and “enhanced” fire-resistive construction requirements in high fire hazard zones can be found in APPENDIX ‘E’. These requirements shall apply to all buildings in the Meadowood Project.

5.2.9 Structure Setbacks from Slope.

All single family homes in the Meadowood development shall have a minimum rear yard setback of 20 feet or more. The slopes within Meadowood are primarily downhill slopes that do not constitute a fire behavior factor. However, there is an area along the northwest side of the project adjacent to lots 154-165 where the slopes are uphill into the project. These perimeter lots have slopes that range from 15-24 percent with the typical slope being 20 percent (See Figure 2 for an illustration of this slope).

Vegetative fuels on the slopes below these lots currently is a mixture of existing groves and pockets of Coastal Sage Scrub. For fire modeling purposes, a mixture of Sage/Buckwheat (FM 18) and Dormant Brush (FM 6) are assumed to be the climax vegetation type should the grove be lost.



Slopes of this low percentage tend to have little impact on fire behavior. Below are two tables developed from the BEHAVE PLUS 3.0.1 Fire Modeling System. The first table (Table 5.1) is for the expected fire behavior due to a 60 MPH NE Santa Ana wind utilizing the same vegetation types of Sage/Buckwheat and Dormant Brush as utilized in Section 2.4.1, northern boundary fuels. Table 5.2 shows the fire behavior during a strong 30 MPH southwest wind on these same 20 percent slopes and fuel types. For purposes of these tables, slopes of 0-100 were utilized in 10 percent increments. As can be seen, the slope has a minor influence as the wind is the dominant factor in fire behavior.

Northern Boundary 60 MPH NE Wind

Slope percent	ROS (max) ft/min	Fireline Intensity Btu/ft/s	Flame Length ft
0	377.1	22654	45.4
10	377.1	22654	45.4
20	377.2	22656	45.4
30	377.2	22662	45.4
40	377.4	22679	45.4
50	377.9	22715	45.4
60	378.6	22781	45.5
70	379.9	22889	45.6
80	381.8	23054	45.7
90	384.6	23291	45.9
100	388.4	23617	46.2

Table 5.1 - Influence of a 20 Percent Slope on Fire Behavior during a 60 MPH Santa Ana Wind

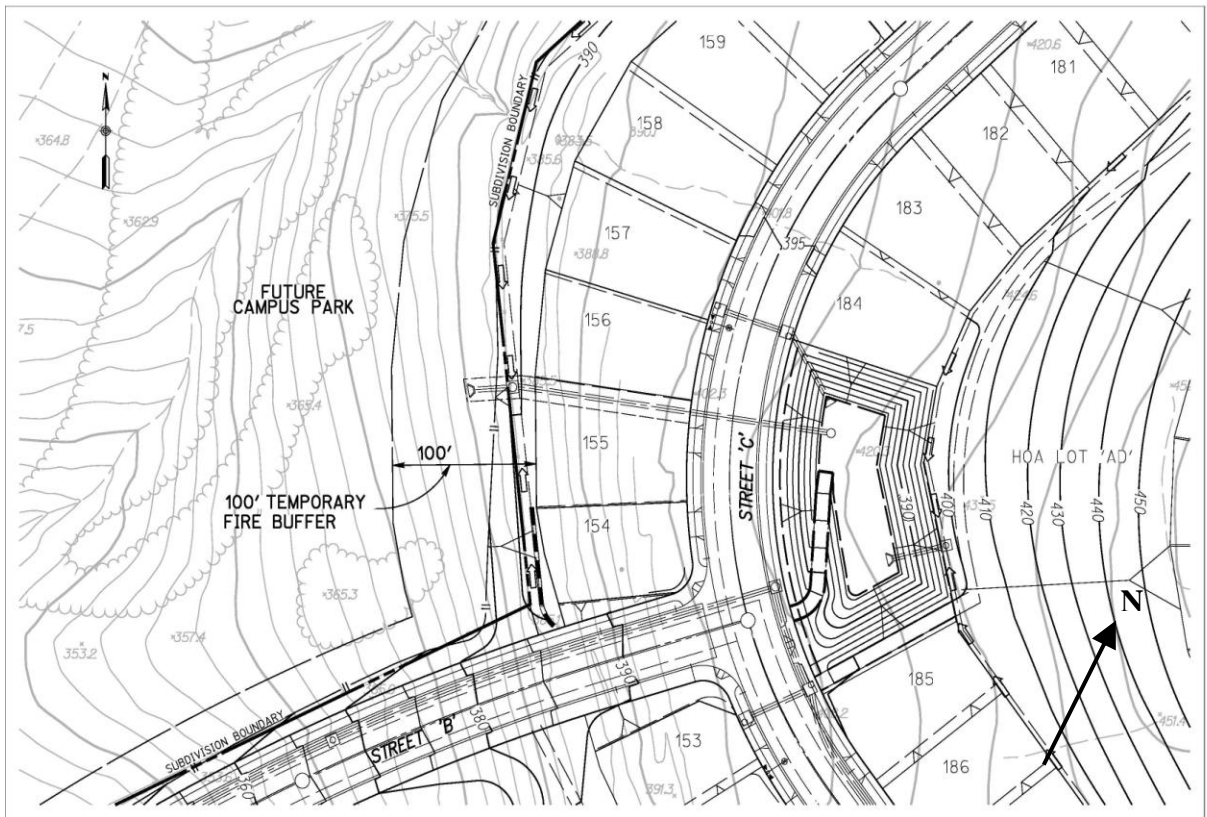
West Boundary 30 MPH SW Wind

Slope percent	ROS (max) ft/min	Fireline Intensity Btu/ft/s	Flame Length ft
0	167.2	11113	32.7
10	167.2	11114	32.7
20	167.2	11116	32.7
30	167.4	11127	32.7
40	167.8	11157	32.7
50	168.6	11220	32.8
60	170.1	11334	33.0
70	172.6	11519	33.2
80	176.3	11797	33.6
90	181.5	12189	34.1
100	188.5	12716	34.8

Table 5.2 - Influence of a 20 Percent Slope on Fire Behavior During 30 MPH SW Winds.

Of perhaps greater concern is the influence of the slope on the projection of the flames and convective heat during strong winds towards structures. On steep slopes, the slope alone will push flames and convective heat toward any structure located adjacent to the slope. Setbacks on steep slopes are therefore a way of deflecting the flames and heat up and over structures located above wildland fuels.

An additional factor in assessing the projected fire behavior is the slope direction. The maximum flame lengths would tend to be blown across the slope during either a strong 60 MPH northeast Santa Ana wind event or during a rare event 30 MPH southwest, not directly toward the lots. The lots are shown below in Illustration 2.



↑ Illustration 2 – Lots with uphill slopes to the building pads. Lots 154-165 Are Shown Above.

As can be seen, the slope faces northwest over most of its length. The only exception is at the southern end of the illustration adjacent to Lots 154-156 where the slope is to the west. The standard 50 feet of Zone A followed by 50 feet of Zone B cannot be met within the project for lots 154-156. For Lot 154, fuel treatment on site shall consist of 30 feet of Zone A followed by 70 feet of Zone B offsite. A retaining wall is also required for Lot 154.

Based upon the projected worst case flame lengths of 45.5 feet northwest of Lots 145-165, the minor 15-24 percent slope, the prescribed fuel treatments, plans for adjacent development of Campus Park (see Illustration 3) and the off-site fuel treatment, the requirement for a setback is met (same practical effect).

5.2.10 Fuel Modification Zone During Construction.

The developer shall install a fuel modification zone prior to allowing any combustible material to arrive on the site and shall maintain the zone for the duration of the Project.

5.3 Resident Education.

The Meadowood Project homeowners, by reviewing this Fire Protection Plan, shall be aware of the herein described fire protection measures; the types of non-combustible construction; and the plant materials that are allowed within their lot boundary. The H.O.A. shall yearly provide the lot owners with information regarding the wildfire mitigation efforts necessary for community fire safety that are contained within this FPP. Of particular importance are APPENDICES 'C', 'D', and 'E' of this plan. These appendices provide guidance in the types of plants that are allowed to be established in landscaped areas and appropriate construction materials for use within fuel modification zones. Plant selection and construction materials are critical as embers often travel over a mile during Santa Ana wind events.

A copy of this plan shall be provided to each lot owner by the builder/developer at the time of the initial sale to the first owner. In the event of the sale of the property, the new property owner shall be provided with a copy of this FPP by the H.O.A. to ensure continued compliance with all Fuel Modification maintenance and construction requirements.

In the event of a wildfire, the homeowner should perform the following:

- Close all windows and doors that lead outside to prevent sparks from entering the house.
- All doors within the house should also be closed in case the house does catch on fire; this will slow down the spread of the fire from room to room.
- Move all combustible materials in the home away from windows to prevent the possibility of heat from a fire radiating through windows and glass doors and catching flammable materials inside the home on fire. This includes drapes, curtains and furniture.
- Close windows and all Venetian blinds or noncombustible window coverings.
- Turn on the lights in each room, porch, and yard. This aids in visibility when the smoke gets thick and darkens the sky.
- Fill all sinks, bathtubs and buckets with water in case the power goes out.
- Shut off any gas valves within the house or outside.
- Open the damper on fireplaces to stabilize inside/outside pressure, but close fireplace screens to keep sparks from igniting the house.
- Have all important papers and valuables including family pets ready for transport should the need to relocate occur.

For additional information, consult with the local Fire Department.

5.4 Mandated Inclusions in the Meadowood Project Covenant and Agreement:

- 1) Each lot owner is personally responsible for all Irrigated Zone A “*firewise*” landscaping fuel treatment measures and thinning Zone B within their property.
- 2) The H.O.A. is responsible for all Irrigated Zone A and Zone B fuel treatment measures in common areas and designated off-site locations found on the Fire Protection Plan Map found in Section 6.0.
- 3) The North County Fire Protection District will hold the H.O.A. of the Meadowood Project accountable for all the maintenance and upkeep required related to the wildland fire protection issues discussed in this plan.
- 4) The H.O.A. shall not allow **TRASH DUMPING OR DISPOSAL OF YARD TRIMMINGS IN THE FUEL TREATMENT ZONES.**
- 5) The H.O.A. shall not allow a lot owner to store any combustible materials beneath any projection, deck or overhang exposed to wildland fuels.
- 6) Each lot owner will be responsible to keep their roof area including gutters and downspouts free of combustible debris including leaves, limbs and similar materials.
- 7) No gates will be permitted on individual lots and no bars will be allowed on structure windows.
- 8) Any secondary structures on individual lots built by property owners must be approved by the NCFPD.
- 9) The Meadowood Project H.O.A. has the responsibility and authority for enforcing Irrigated Zone A and Zone B fuel treatment measures on any privately owned lot.
- 10) All landscaping plans, proposed additional structures or conversion of existing structures to other uses, must be reviewed and approved under the guidance and approval of the North County Fire Protection District.
- 11) Any disputes related to the Meadowood Project H.O.A. Board approval of individual lot landscaping or fuel treatment, with respect to interpretation of the Meadowood Fire Protection Plan, shall be decided by the North County Fire Protection District or its designated representative and whose decision shall be final and binding on the lot owner.
- 12) The Meadowood Project H.O.A. shall be required to annually fund a Fire Captain position at the NCFPD current hourly rate for a period of 2 weeks (80 hours). This position shall act as a liaison between the Meadowood Project H.O.A. and NCFPD. The position shall be utilized as follows:
 - Conduct inspections of parking areas and fuel modification treatment zone maintenance (H.O.A. Common Areas and individual owner lots), the status of the

limited building zone buffering open space lots from residential lots, agricultural groves, and native open space and make recommendations to the H.O.A. to correct any inadequacies or fire hazards.

- Provide the H.O.A. with fire prevention education materials in print, electronic and other formats and make presentations regarding wildfire mitigation measures prescribed in the approved Fire Protection Plan for the Meadowood Project.
- Attend H.O.A. meetings and provide input regarding compliance with the approved Fire Protection Plan.
- Report semi-annually to the NCFPD Fire Chief with a copy to the H.O.A. on the status of H.O.A. compliance with the approved Fire Protection Plan.

13) All lot/homeowners will financially support the annual maintenance of Fuel Modification Areas performed by the Meadowood Project H.O.A. in favor of the lot owners.

14) Any damaged or replacement window, siding, roof coverings, and specified non-combustible walls will meet or exceed the original intent of the fire protection requirements discussed in this Plan.

15) The NCFPD will be designated as a third party beneficiary of a homeowners' association's duty to perform "Fire Prevention Maintenance" (as defined below) for all portions of the Association Property (or Common Area) that constitute Fuel Modification Zones and designated interior/manufactured slopes to be maintained by the Homeowner's association, and of any owner's duty to comply with any Fuel Modification Zone restrictions applicable to his lot. Additionally, NCFPD shall have the right, but not the obligation, to enforce the homeowners' association's duty to perform such Fire Prevention Maintenance, and to enforce compliance by any owner with any Fuel Modification Zone restrictions applicable to his/her lot. In furtherance of such right, NCFPD shall be entitled to recover its costs of suit, including its reasonable attorneys' fees, if it prevails in an enforcement action against the homeowners' association and/or an individual owner.

As used herein, "Fire Prevention Maintenance" shall mean the following:

- (i) All portions of the Association Property (or Common Area) that constitute Fuel Modification Zones or designated interior/manufactured slopes shall be regularly maintained by the homeowners association on a year round basis in accordance with the Fire Protection Plan on file with the property manager or agent for the H.O.A. for the development.
- (ii) The irrigation system for Fuel Modification Zones or designated interior/manufactured slopes shall be kept in good condition and proper working order at all times. The irrigation system shall not be turned off except for necessary repairs and maintenance.

5.5 Water Supply and Fire Hydrants

The Meadowood Project water supply is proposed to be provided by the Rainbow Municipal Water District, the San Luis Rey Municipal Water District or the Valley Center Municipal Water District water system. To reduce water impacts, the agricultural groves will be irrigated with reclaimed water and may use groundwater during drier months. The use of reclaimed water for irrigation of fuel treatment areas is also allowable.

Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems, as approved by the fire code official, capable of providing the required fire flow in a reliable manner. In setting the requirements for fire flow, the fire code official shall follow section 508.3, Appendix B of the County Fire Code or the standard published by the Insurance Services Office, "Guide for Determination of Required Fire Flow".

NCFPD requires that in residential areas, there will be a minimum of 40 residential type fire hydrants, with drip caps and blue dot markers having a flow capable of supplying 1,500 GPM at 20 pounds residual pressure with not less than 2,500 GPM available in the mains. Additional hydrants may be required based on the final site plan. Hydrants shall be located at intersections, at the beginning radius of cul-de-sacs and at intervals of not greater than 650 feet in single family residential areas. Hydrants located across heavily traveled roadways shall not be considered as serving the subject property.

In multi-family dwelling and commercial zones, commercial type fire hydrants (one 4" port and two 2 1/2" ports) shall be installed at intersections. In multi-family zones and in commercial and industrial zones, fire hydrants shall be installed at intersections, at the beginning radius of cul-de-sacs, and every 300 feet of fire access roadways.

All fire hydrants shall be connected to a public water main to ensure adequate maintenance and fire flow. Hydrants, mains and water pressures have been designed to comply with County of San Diego Code requirements. Please refer to Civil Engineering Design Plans for detailed information concerning the water system and hydrant locations.

5.6 Access Roads, Driveways, Gates and Other Features

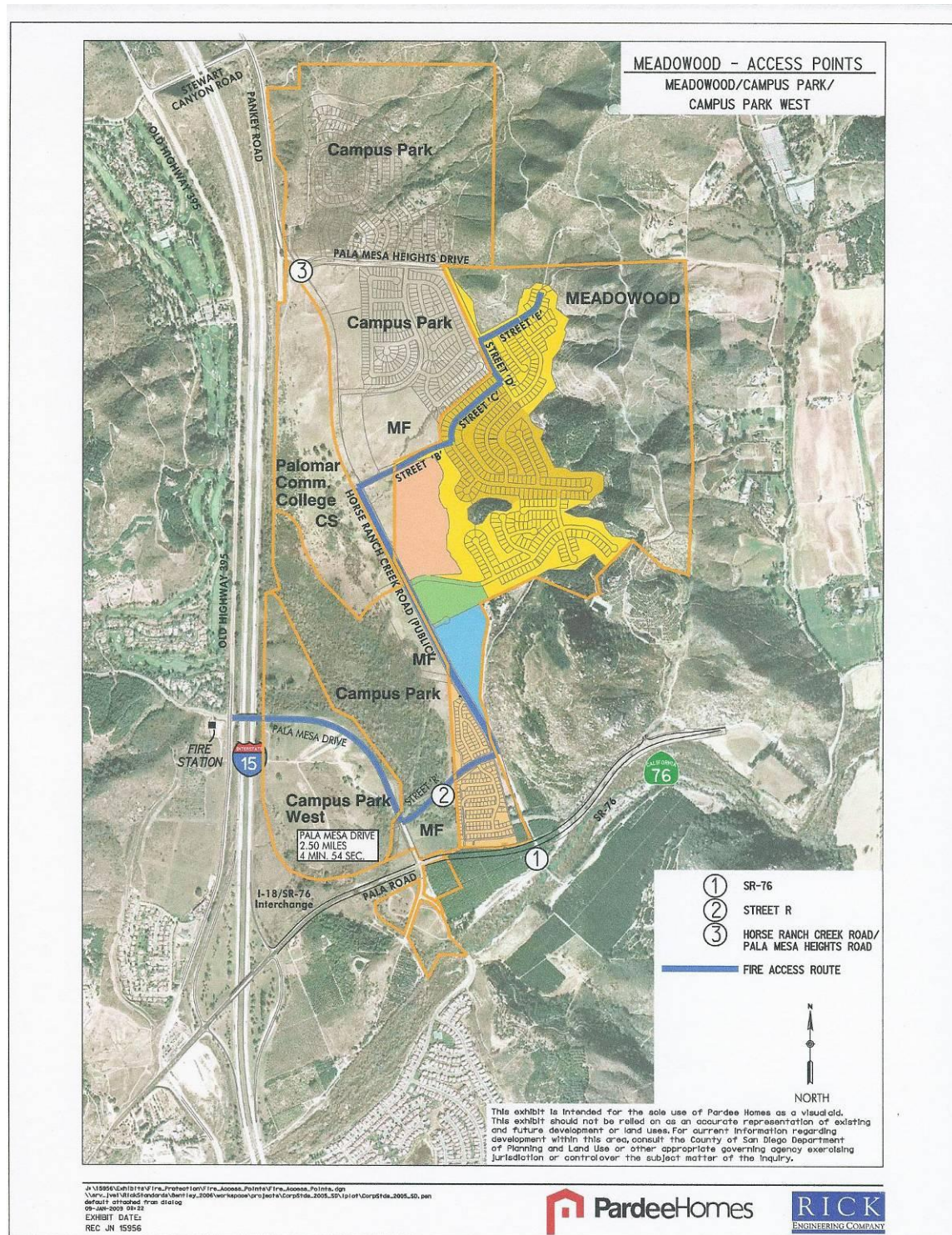
Access Roads: All streets and cul-de-sacs have been designed to County of San Diego Public Road Standards except for Horse Ranch Creek Road (Refer to Civil Engineering Design Plans). The applicant proposes to construct Horse Ranch Creek Road per General Plan Update Circulation Element "Boulevard" standards and has submitted a request for a modification to a road standard which has been approved by the County of San Diego under separate cover. Horse Ranch Creek Road is proposed as a "Boulevard" from the existing portion of Pankey Road that exists south of Stewart Canyon Road to SR76 along a new alignment. No road within the development shall exceed a 20 percent grade. The minimum roadway width is 24 feet within the multi-family portion of the development. The narrowest public road is 52 feet including sidewalks on both sides of the roadway. All cul-de-sacs on access roads of greater than 150 feet in length shall be provided with a minimum 42 foot AC radius turnaround. Clearance of brush or vegetative growth along new and existing on and off-site roadways will comply with either Section 5.2.6 and 5.2.7 as appropriate which meets or exceeds the Consolidated Fire Code for the 17 fire protection districts in San Diego County including the North County Fire Protection District.

Secondary ingress and egress for the project area is via a new proposed road that will connect Horse Ranch Creek Road in the vicinity of the multi-family area (PA - 1) to Pala Mesa Drive or what was Pankey Road to the west (Illustration 3). With this feature, fire equipment response times to all portions of the development will be within 5-minutes as is shown in the illustration as a blue line over the access route. Future expansion as additional development occurs including the Campus Park Project calls for Horse Ranch Creek Road to be extended to the north to eventually tie into Interstate 15 north of the Project.

A fire access road to the northeast to Rice Canyon has been added as an additional design feature. Its main purpose is to provide access for emergency responders, as well as homeowner egress during emergency operations. This fire access road shall be a minimum of 24-feet wide except for an approximate length of 500-feet which shall have a minimum width of 20-feet, which was previously approved by the NCFPD. The road shall be paved with asphaltic concrete where the grades are less than or equal to 15%. Grades up to 20% shall be allowed with additional mitigation measures that meet with the approval of NCFPD, including paving with concrete. It will be available for public hiking and be part of the trail system within the Meadowood project. Maintenance including roadside fuel treatment shall be performed by the HOA.

All fire access roads shall be designed and maintained to support the imposed loads of fire apparatus (not less than 50,000 lbs.) and shall be provided with an approved surface to provide all-weather driving capabilities. Access roads shall be designed and built at less than a 15 percent grade where possible. Grades up to 20 percent may be allowed with additional mitigation measures with the approval of the NCFPD. Roadway design features (speed bumps, speed humps, speed control dips, etc.) which may interfere with emergency apparatus responses shall not be installed on fire access roadways, unless they meet design criteria approved by the NCFPD.

Horse Creek Ranch Road from SR76 to Stewart Canyon shall be in fire code compliance for a secondary access prior to construction in PA's 4 and 5.



↑ Illustration 3 – Road access and travel time to the most distant portion of the project from the closest North County Fire Protection District Station No. 4 is 2.5 miles or less than a 5 minute response time per NFPA 1142 (2007).

Driveways and Gates. Driveways will provide access from streets to the single family homes. No driveway shall exceed 150 feet in length. Single-family residential driveways, serving no more than two single-family dwellings, shall have a minimum of 16 feet of unobstructed improved width. Fuel treatment within 20 feet of a driveway shall be to Irrigated Zone A criteria. All gates or other structures or devices which could obstruct fire access roadways or otherwise hinder emergency operations are prohibited unless they meet standards approved by the Chief of the North County Fire Protection District, and receive specific plan approval. In the event of a conflict between the County of San Diego and the NCFPD regarding the use of gates, the conflict will be resolved between those two parties, to which Meadowood will comply, prior to the recordation of final maps.

Parking. Parking in multi-family areas has been addressed and exceeds County requirements as demonstrated in the Table 2 labeled Parking Allocation – Multi-Family Planning Areas. Within multi-family areas PA-1 and P-4 private streets provide the means of access to parking spaces and garages. These private streets shall be designated as “fire lanes” and signed per the NCFPD. All fire access roadways are within sufficient proximity to the homes to allow a 150 foot hose pull to all the exterior portions of buildings (See Illustration 4 developed by Rick Engineering Company on the following page).

Firefighter Design Elements.

Following in Illustration 4 for the multi-family area PA-4 is a typical example of the required hose pull. All portions of these dwellings are located within 150 feet of a hose line stretch on all ground level exterior portions of the buildings. See Engineering Drawings for additional information.

Parking Allocation - Multi-Family Planning Areas

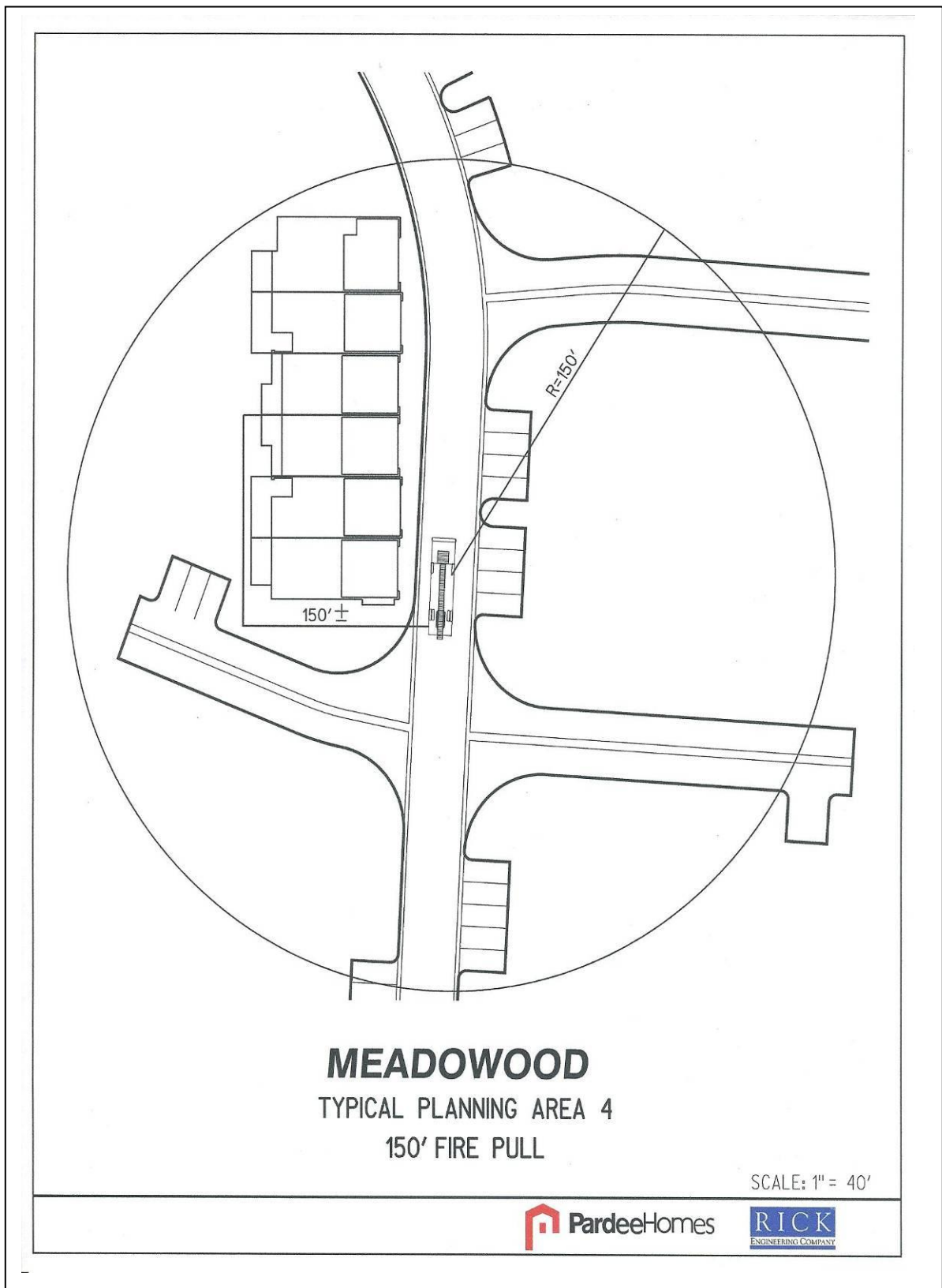
**Planning Area 1
(164 Units)**

	Required	Provided
In Garages	328	328
Guest	33	90
Rec. Center	0	0
Wastewater Treatment Facility	3	3
Total	364	421

**Planning Area 4
(325 Units)**

	Required	Provided
In Garages	650	650
In Driveway	0	12
Guest	65	193
Rec. Center	33	33
Total	748	888

↑ Table 2 – Parking Allocation for the Meadowood Development



↑ Illustration 4 – Planning Area 4--Typical Parking Area Demonstrating Hose Pull Of 150 Feet.

Sidewalks to each dwelling unit front door from either driveways or roads will be provided for emergency responder use as well as residents. Patios will be located as practical around the multi-family areas that will enable firefighters to raise ladders to upper stories.

6.0 Fire Protection Plan Map

The following page is a folder containing the Meadowood Fire Protection Plan Map, which depicts the location of all proposed fuel modification treatment locations proposed for the Meadowood Project home and school construction. It also identifies those structures that require additional Enhanced Fire-Resistive Building Features. This map also depicts the adjacent developed lots as a reference for interlinking fuel treatments between two or more lots.

FIREWISE 2000, Inc. believes that once all the herein described fuel treatments and “Enhanced” building features (and where required, Additional Enhanced Fire-Resistive Construction Features) are implemented, the wildfire threat to the Meadowood Project development will be reduced to less than a significant level.

7.0 CONCLUSIONS

This FPP evaluated the adverse environmental effects that a proposed residential development may have from wildland fire and to properly mitigate those impacts to ensure that this development does not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

- The requirements of this FPP provide the fuel modification standards to mitigate the exposure of people or structures to a significant risk of loss, injury or death. Zone A is the level building pad and provides the defensible space zone for fire suppression forces and will protect structures from radiant and convective heat. This zone will also be a landscaped zone that is permanently irrigated and consists of fire resistant and maintained plantings. Zone B is the next 50 feet from a structure and includes all manufactured slopes and provides removal of 50 percent of the native vegetation at a minimum, including all prohibited highly combustible native vegetation, but permits plantings with very specific criteria.
- The development will have adequate emergency access in terms of access and construction standards for roadways and streets. NCFPD, CAL FIRE, and other nearby fire departments through mutual aid, will provide fire protection. Emergency response travel times and the proximity of the development to the Wildland Urban Interface (WUI), and a subdivision in a Very High Fire Hazard Severity Zone and High Fire Hazard Zone require fire sprinklers in all residences.
- Water supplies via pipelines, hydrants, and related requirements will provide adequate water for fire protection.

8.0 LIST OF PREPARERS, PERSONS AND ORGANIZATIONS CONTACTED

Below are the list of preparers and persons and organizations contacted during the course of preparing this Fire Protection Plan.

8.1 List of Preparers

The principal author and preparer of this Fire Protection Plan is David C. Bacon, President of ***FIREWISE 2000, Inc.***, a San Diego County DPLU certified wildland fire consultant. Another ***FIREWISE 2000, Inc.*** member contributed to this plan with comments and peer review. This member included Herbert Spitzer, Senior Wildland Fire Associate.

8.2 List of Persons and Organizations Contacted During the Course of this Project

Contacts include but were not limited to the following individuals:

1. Jimmy Ayala, Pardee Homes
2. James Beebe – North County Fire Protection District
3. John Cook, ASM Affiliates
4. Bobbi Herdes, RECON
5. Karen Kosup, Pardee Homes
6. Sid Morel, Fire Marshal – North County Fire Protection District
7. Andrew Reese, Office of James Barnett
8. Karen Van Ert, Rick Engineering
9. Mike While, Rick Engineering
10. Alan Ziegaus, Southwest Strategies LLC